

WHAT IS CLAIMED IS:

1. A deposited-film formation process in which
a source gas is fed into a discharge space of a
reactor and an electric power is applied to generate
5 discharge in the discharge space to decompose the
source gas, thereby forming a deposited film; the
process comprising disposing a plurality of discharge
means in the reactor and having:

10 a first step of applying an electric power to a
first discharge means to generate discharge to form
the deposited film; and

a second step of applying an electric power to
a second discharge means to generate discharge to
form the deposited film;

15 said first step and said second step being
switched from one to another at a stated timing.

2. A deposited-film formation process in which
a source gas is fed into a discharge space of a
20 reactor and an electric power is applied to generate
discharge in the discharge space to decompose the
source gas, thereby forming a deposited film; the
process comprising disposing a plurality of discharge
means in the reactor and having:

25 a first step of applying to a first discharge
means an electric power larger than that for a second
discharge means to generate discharge to form the

deposited film; and

a second step of applying to the second discharge means an electric power larger than that for the first discharge means to generate discharge
5 to form the deposited film;

said first step and said second step being switched from one to another at a stated timing.

3. A deposited-film formation process in which
10 a source gas is fed into a discharge space of a reactor and an electric power is applied to generate discharge in the discharge space to decompose the source gas, thereby forming a deposited film; the process comprising disposing a plurality of reactors
15 having at least one discharge means and having:

a first step of applying an electric power to a first discharge means in a first reactor to generate discharge to form the deposited film; and

a second step of applying an electric power to
20 a second discharge means in a second reactor to generate discharge to form the deposited film;

said first step and said second step being switched from one to another at a stated timing.

25 4. A deposited-film formation process in which a source gas is fed into a discharge space of a reactor and an electric power is applied to generate

discharge in the discharge space to decompose the source gas, thereby forming a deposited film; the process comprising disposing a plurality of reactors having at least one discharge means and having:

5 a first step of applying to a first discharge means in a first reactor an electric power larger than that for a second discharge means in a second reactor to generate discharge to form the deposited film; and

10 a second step of applying to the second discharge means in the second reactor an electric power larger than that for the first discharge means in the first reactor to generate discharge to form the deposited film;

15 said first step and said second step being switched from one to another at a stated timing.

5. The deposited-film formation process according to claim 2, wherein in the first step the
20 electric power is applied to the second discharge means to generate discharge to an extent that does not affect the film formation, and in the second step the electric power is applied to the first discharge means to generate discharge to an extent that does
25 not affect the film formation.

6. The deposited-film formation process

according to claim 1, wherein the first step and the second step are switched from one to another on the basis of a film formation temperature that has reached a temperature within a temperature range set 5 beforehand.

7. The deposited-film formation process according to claim 1, wherein said first step and said second step are switched from one to another on 10 the basis of a self-bias voltage that has reached a voltage within a voltage range set beforehand.

8. The deposited-film formation process according to claim 1, wherein said first step and 15 said second step are switched from one to another on the basis of a self-bias electric current that has reached an electric current within an electric-current range set beforehand.

20 9. The deposited-film formation process according to claim 1, wherein said first step and said second step are switched from one to another within a film formation time range set beforehand.

25 10. The deposited-film formation process according to claim 1, wherein said first and second discharge means are controlled within a stated

temperature range.

11. The deposited-film formation process according to claim 1, which comprises a step of
5 keeping the electric power applied to said first discharge means and said second discharge means to generate discharge through the respective discharge means when said first step and said second step are switched from one to another.

10

12. The deposited-film formation process according to claim 1, wherein, when said first step and said second step are switched from one to another, the electric power for said first discharge means is
15 gradually decreased or increased and the electric power for said second discharge means is gradually increased or decreased.

13. The deposited-film formation process
20 according to claim 1, wherein the deposited film formed through said first step and the deposited film formed through said second step are semiconductor layers having the same conductivity type.

25 14. The deposited-film formation process according to claim 1, wherein a distance between said first and second discharge means and a substrate on

which the deposited films are formed is in the range of from 5 mm to 50 mm, and a pressure at which the deposited films are formed is in the range of from 10 Pa to 800 Pa.

5

15. A deposited-film formation system in which a source gas is fed into a discharge space of a reactor and an electric power is applied to generate discharge in the discharge space to decompose the
10 source gas, thereby forming a deposited film; the system comprising:

a plurality of discharge means disposed in the reactor; and

15 a means for switching i) a first step of generating discharge by a first discharge means to form the deposited film and ii) a second step of generating discharge by a second discharge means to form the deposited film, from one to another on the basis of a value detected by a means for detecting a
20 stated film formation parameter.

16. A deposited-film formation system in which a source gas is fed into a discharge space of a reactor and an electric power is applied to generate
25 discharge in the discharge space to decompose the source gas and thereby form a deposited film; the system comprising:

a plurality of discharge means disposed in the reactor; and

5 a means for switching i) a first step of applying to a first discharge means an electric power larger than that for a second discharge means to generate discharge to form the deposited film and ii) a second step of applying to the second discharge means an electric power larger than that for the first discharge means to generate discharge to form 10 the deposited film, from one to another on the basis of a value detected by a means for detecting a stated film formation parameter.

17. A deposited-film formation system in which 15 a source gas is fed into a discharge space of a reactor and an electric power is applied to generate discharge in the discharge space to decompose the source gas, thereby forming a deposited film; the system comprising:

20 a plurality of discharge means disposed in the reactor; and

a means for switching i) a first step of applying an electric power to a first discharge means in a first reactor to generate discharge to form the 25 deposited film and ii) a second step of applying an electric power to a second discharge means in a second reactor to generate discharge to form the

deposited film, from one to another on the basis of a value detected by a means for detecting a stated film formation parameter.

5 18. A deposited-film formation system in which a source gas is fed into a discharge space of a reactor and an electric power is applied to generate discharge in the discharge space to decompose the source gas, thereby forming a deposited film; the
10 system comprising:

 a plurality of reactors having at least one discharge means, disposed in the reactor; and
 a means for switching i) a first step of applying to a first discharge means in a first
15 reactor an electric power larger than that for a second discharge means in a second reactor to generate discharge to form the deposited film and ii) a second step of applying to the second discharge means in the second reactor an electric power larger
 than that for the first discharge means in the first reactor to generate discharge to form the deposited film, from one to another on the basis of a value detected by a means for detecting a stated film formation parameter.

25

 19. The deposited-film formation system according to claim 15, wherein said film formation

parameter is film formation temperature.

20. The deposited-film formation system according to claim 15, wherein said film formation
5 parameter is self-bias voltage.

21. The deposited-film formation system according to claim 15, wherein said film formation parameter is self-bias electric current.

10

22. The deposited-film formation system according to claim 15, wherein said film formation parameter is film formation time.

15

23. The deposited-film formation system according to claim 15, wherein said first and second discharge means are controlled within a stated temperature range.

20

24. The deposited-film formation system according to claim 15, wherein, when said first step and said second step are switched from one to another, the electric power for said first discharge means is gradually decreased or increased and the electric
25 power for said second discharge means is gradually increased or decreased.

25. The deposited-film formation system according to claim 15, wherein the deposited film formed through said first step and the deposited film formed through said second step are semiconductor
5 layers having the same conductivity type.